SUMMARY OF SAFETY AND EFFECTIVENESS DATA

I. GENERAL INFORMATION

Device Generic Name:	senofilcon A hydrophilic contact lens
Device Trade Name:	VISTAKON® (senofilcon A) Contact Lens, Clear and Visibility Tinted with UV Blocker
Applicant's Name and Address:	VISTAKON® Division of Johnson & Johnson Vision Care 7500 Centurion Parkway Suite 100 Jacksonville, FL 32256
Date(s) of Panel Recommendation:	None
Premarket Approval Application (PMA) Number:	P040045
Date of Good Manufacturing Inspection:	January 28, 2005
Date of Notice of Approval to Applicant:	December 20, 2005

II. INDICATIONS FOR USE

The VISTAKON® (senofilcon A) Soft Contact Lens (spherical) is indicated for the optical correction of refractive ametropia (myopia and hyperopia) in phakic or aphakic persons with non-diseased eyes who have 1.00D or less of astigmatism.

The VISTAKON® (senofilcon A) Multifocal Soft Contact Lens is indicated for the optical correction of distance and near vision in presbyopic, phakic or aphakic persons with non-diseased eyes who may have 0.75D of astigmatism or less.

The VISTAKON® (senofilcon A) Toric Soft Contact Lens is indicated for the optical correction of visual acuity in phakic or aphakic persons with non-diseased eyes that are hyperopic or myopic and may have 10.00D of astigmatism or less.

The VISTAKON® (senofilcon A) Multifocal-Toric Soft Contact Lens is indicated for the optical correction of distance and near in presbyopic phakic or

aphakic persons with non-diseased eyes who may have 10.00D of astigmatism or less.

VISTAKON® (senofilcon A) UV Blocking Contact Lenses help protect against transmission of harmful UV radiation to the cornea and into the eye.

VISTAKON® (senofilcon A) Contact Lenses may be prescribed for daily wear and extended wear for up to 6 nights/ 7 days of continuous wear. It is recommended that the contact lens wearer first be evaluated on a daily wear schedule. If successful, then a gradual introduction of extended wear can be followed as determined by the prescribing eye care professional.

The lenses may be prescribed for either for single-use disposable wear or frequent/planned replacement wear with cleaning, disinfection and scheduled replacement. When prescribed for frequent/planned replacement wear, the lenses may be cleaned and disinfected using a chemical disinfection system only.

III. CONTRAINDICATIONS

DO NOT USE the VISTAKON® (senofilcon A) Contact Lens when any of the following conditions exist:

- Acute or subacute inflammation or infection of the anterior chamber of the eye
- Any eye disease, injury or abnormality that affects the cornea, conjunctiva or eyelids
- Severe insufficiency of lacrimal secretion
- Corneal hypoesthesia (reduced corneal sensitivity), if aphakic
- Any systemic disease that may affect the eye or be exaggerated by wearing contact lenses
- Allergic reactions of ocular surfaces or adnexa that may be induced or exaggerated by wearing contact lenses or use of contact lens solutions
- Allergy to any ingredient, such as mercury or thimerosal, in a solution which is to be used to care for the contact lenses
- Any active corneal infection (bacterial, fungal, protozoal or viral)
- If eyes become red or irritated

IV. WARNINGS AND PRECAUTIONS

The warnings and precautions can be found in the VISTAKON® (senofilcon A) Soft Contact Lens labeling (attached).

V. DEVICE DESCRIPTION

The VISTAKON® (senofilcon A) Soft Contact Lenses are available as a spherical, multifocal, toric or a multifocal-toric lens. The lenses are made of a silicone

hydrogel material that is approximately 38% water and 62% senofilcon A, and contains an internal wetting agent with or without a visibility tinted UV absorbing monomer.

The VISTAKON® (senofilcon A) Soft Contact Lens Visibility Tinted with UV Blocker is tinted blue using Reactive Blue Dye #4 to make the lenses more visible for handling.

A benzotriazole UV absorbing monomer is used to block UV radiation. The transmittance characteristics are less than 1% in the UVB range of 280 nm to 315 nm and less than 10% in the UVA range of 316 nm to 380 nm for the entire power range.

VI. ALTERNATIVE PRACTICES AND PROCEDURES

The alternative practices and procedures to correcting vision by wearing the VISTAKON® (senofilcon A) Soft Contact Lenses include wearing other daily and extended wear soft contact lenses, rigid gas permeable daily and extended wear contact lenses, spectacles, and corrective surgeries such as radial keratotomy, photorefractive keratectomy and LASIK.

VII. MARKETING HISTORY

United States:

VISTAKON® (senofilcon A) Soft Contact Lenses for daily wear have been commercially available in the United States.

International:

VISTAKON® (senofilcon A) Soft Contact Lenses bear the CE Mark and are commercially available to the European Union market for daily and extended wear. To date, regulatory approvals have also been attained in Canada, Australia, New Zealand and Korea.

The soft contact lens has not been withdrawn from marketing for any reason relating to the safety and effectiveness of the device.

VIII. POTENTIAL ADVERSE EFFECTS OF THE DEVICE ON HEALTH

Potential adverse effects on health associated with extended wear contact lenses include eye problems such as corneal ulcers, epithelial microcysts, infiltrates and endothelial polymegathism. The risk of corneal ulcers has been shown to be greater among users of extended wear contact lenses than among users of daily wear contact lenses. The risk among extended wear users increases with the number of consecutive days that the lenses are worn between removals, beginning with the first overnight use. In addition, smoking increases the risk of corneal

ulcers for contact lens users, especially when lenses are worn overnight or while sleeping. Strict compliance with the proper lens care regimen and wearing schedule is essential in minimizing risk.

IX. SUMMARY OF PRECLINICAL STUDIES

The objective of the preclinical studies was to provide reasonable assurance of the safety of the VISTAKON® (senofilcon A) Soft Contact Lenses prior to human clinical testing.

The VISTAKON® (senofilcon A) Soft Contact Lenses have undergone a comprehensive battery of toxicological, physiochemical, lens care compatibility and sterility/stability testing summarized in Table 1 below.

Table 1: Preclinical Tests

Test	Result
Toxicology	Toxicity testing was conducted under GLP conditions on the visibility tinted version of the product as it is considered "worse case" and supports both the clear and visibility tinted lens material. All toxicology studies were conducted in accordance with the Good Laboratory Practice (GLP) Regulation, 21 CFR 58 or valid scientific protocols and include: o Leachables o ISO Acute Systemic Toxicity in the mouse (extracts) o ISO Ocular Irritation Study in the rabbit (single exposure, extracts) o Cytotoxicity Study Using the ISO agarose overlay method (solid) o Murine Local Lymph Node Assay (LLNA) Test (extracts) o 22-Day ISO Ocular Irritation Study in the rabbit All test results support the safety of the lens material.

Test	Result
Solution Compatibility	The VISTAKON® (senofilcon A) Contact Lens Clear and Visibility Tint with UV blocker was evaluated for compatibility with lens care regimens as described in the May 1994 Premarket Notification 510(k) Guidance Document for Daily Wear Contact Lenses. The testing demonstrated that lens handling, cleaning and disinfection procedures, with representative lens care solutions, do not alter the optical and performance characteristics of the lens.

Preservative Uptake and Release	Uptake and release studies of preservatives by VISTAKON® (senofilcon A) Contact Lenses were performed in accordance with FDA's May 1994 Premarket Notification 510(k) Guidance Document for Daily Wear Contact Lenses. Uptake and release of Polyhexamethylene Biguanide (PHMB), Polyquaternium-1 (POLYQUAD), and Polyaminopropyl Biguanide (DYMED) was measured. Testing demonstrated that no measurable uptake of preservatives nor any release was observed upon exposure of the VISTAKON® (senofilcon A) Soft Contact Lens to the preservatives present in representative lens care solutions.
Shelf Life Stability	An expiration date of 6 years has been established for the VISTAKON® (senofilcon A) Soft Contact Lenses.

Test	Result
Physicochemical Properties	

Property	Clear	Visibility Tinted
Water Content, %	38	38
Refractive Index @ 20°C	1.42	1.42
*Dk, edge corrected	103	103
*Dk, non edge corrected	122	122
Specific Gravity, calculation	0.98 – 1.12	0.98 – 1.12
Color	clear	blue
Light Transmittance @ 628 - 648 nm, %	≥ 95	≥85 but ≤99
Light Transmittance @ 316 - 380 nm, %	< 10	< 10
Light Transmittance @ 280 - 315 nm, %	< 1	< 1
Tensile Strength, psi	117	117
Elongation, %	257	257
Modulus, psi	87	87
Toughness, in lb/in^3	139	139

X. SUMMARY OF CLINICAL STUDIES

Corneal Swell Study: Non-Dispensing Overnight Corneal Swelling Performance of senofilcon A and Control Lenses

The objective of this study was to evaluate the corneal swelling produced by senofilcon A and a control hydrophilic contact lens in adapted daily wear soft contact lens patients during overnight wear. The experimental design was a randomized, single masked (patient masked), bilateral cross-over study. The same contact lens type was worn in both eyes at any given time, however, only the right eye of each subject was measured for corneal swelling. The bilateral wearing design was selected in view of the previously reported contralateral sympathetic effect on corneal swelling. The subjects wore the contact lenses for at least half an

hour in the evening prior, and eight hours of closed eye wear including sleep. The swelling measured with the control contact lenses (5.83%) was significantly greater than that measured with the senofilcon A contact lenses (1.40%).

Safety and Efficacy Study: VISTAKON® (senofilcon A) Soft Contact Lens for Extended Wear:

Objective

The objective of this clinical trial was to determine whether the VISTAKON® (senofilcon A) Soft Contact Lens worn for up to 30 days and nights extended wear and replaced on a monthly basis, performs as well as the control lens, when worn for up to one week and replaced on a weekly basis.

Study Design

This clinical trial was a prospective, randomized, contralateral, controlled clinical trial lasting twelve months. The investigators and subjects were not masked.

Of the 1075 subjects who signed the informed consent, 29 were screen failures and a total of 1046 subjects enrolled in the trial at 33 investigational sites throughout the United States, completing at least their Initial Visit. Among those enrolled, nine subjects were not dispensed lenses due to a failed trial fitting or were lost to follow-up. A total of 1037 subjects were dispensed study lenses and continued the study with at least one follow-up visit. The subjects' eye/ lens type assignments were randomized with all subjects wearing both a control and trial lens throughout their participation in the trial.

The VISTAKON® (senofilcon A) Soft Contact Lens wear schedule was 30 days of continuous wear after which it was removed for one night prior to beginning a new wear cycle. The control lens wear schedule was 6 nights and 7 days of extended wear after which the lens was removed for one night prior to the next wear cycle. Lens replacements were scheduled to occur at the start of each 30-day (monthly) and 7-day (weekly) cycle.

Only the use of Bausch & Lomb's ReNu Multiplus Multi-Purpose Solution – NO RUB when cleaning and disinfecting was allowed. In addition, LENS PLUS Rewetting Drop solution was provided for use as needed.

The primary safety and efficacy endpoints were:

- Incidence rate of serious and significant corneal inflammatory adverse events
- Incidence rate of symptoms, problems, or complaints (SPC) at each scheduled visit

- Incidence rate of contact lens corrected visual acuity worse than 20/40 at each scheduled visit.

For the safety and efficacy endpoints a non-inferiority statistical design was employed. Non-inferiority was considered to have been shown for a given endpoint if the 1-sided 95% upper confidence limit of the difference in rates (senofilcon A rate minus control rate) was less than the "margin of equivalence." The "margin of equivalence" was taken to be 5% for the adverse event endpoint and for the visual acuity endpoint. The "margin of equivalence" was taken to be 10% for the "symptoms" endpoint.

Subject Assessments

There were eight scheduled subject visits during the course of the trial (Initial, 24 Hour, 1, 4, 12, 24, 36 and 52 Week). Subjects were given sufficient quantities of lenses to allow for scheduled and at least one unscheduled lens replacement between visits. Care was taken to instruct the subjects in the different wear and replacement schedules required for the trial lenses assigned to them.

An adverse event was reported if any of the following occurred:

- An event that fit the defined or listed diagnosis as described in the protocol;
- A slit lamp finding requiring treatment (grade 2 or less), including temporary discontinuation of contact lens wear;
- A symptom, problem, complaint, requiring treatment, including temporary discontinuation of contact lens wear.

All adverse events were classified as serious, significant, or non-significant. Each event was rated as to its likelihood of being contact lens related and all were tracked throughout the study.

Any subject who became pregnant during the study was discontinued from study participation. Any subject missing or reporting to a scheduled follow-up visit outside the required visit date range three times during the course of the study was discontinued. In addition, all subjects were required to have reported for the final 52-week visit.

Demographic Data

Of the 1046 subjects who were enrolled in the study, 730 subjects were female and 316 subjects were male with the ratio equaling 2.3 females to 1 male. This distribution is considered representative of the contact lens wearing population. The subjects ranged in age from 18 years to 64 years with an average age of 32 years. Lens powers ranged from –1.00D to –6.00D for both the control and trial eyes.

The previous lens wearing experience of the study population was 85.3% successful daily wear, 13.8% successful extended wear, 0.6% new wearers, 0.3% RGP, and 0.1% unsuccessful extended wear

The statistical analysis utilized pooled study data from the 33 investigational sites. The sites' subject bases were similar with respect to size and demographics. All investigational sites followed the same detailed investigational plan.

Data Analysis and Results--Adverse events:

Of the 1046 subjects enrolled 1037 were dispensed lenses contralaterally (wearing a control lens in one eye and a VISTAKON® (senofilcon A) Contact Lens in the other). Investigators were instructed to report all adverse events for the duration of the study. Data from events experienced by eyes with at least one serious or significant corneal inflammatory adverse reaction were analyzed. If an eye had more than one event only the most severe event experienced was counted. Table 2 shows the serious and significant corneal inflammatory adverse event incidence rates for the VISTAKON® (senofilcon A) Soft Contact Lens and the control lens. Table 3 shows serious and significant events that were not considered endpoint events.

Table 2
Eyes with at least one Corneal Inflammatory Adverse Event

Eyes Dispensed for each lens type: 1037	**Vistakon®**		**Control**	
Corneal Inflammatory Events	**n**	**%**	**n**	**%**
Serious				
Microbial Keratitis	1	0.1%	1	0.1%
Sterile Central Corneal Ulcer	1	0.1%	0	0.0%
Significant				
Contact Lens Peripheral Ulcer (CLPU)	34	3.3%	8	0.8%
Contact Lens Associated Red Eye (CLARE)	4	0.4%	2	0.2%
Infiltrative Keratitis (IK)	20	1.9%	13	1.2%
Total	60	5.8%	24	2.3%

Table 3
Eyes with at least one Other Serious or Significant Adverse Event

Eyes Dispensed for each lens type: 1037	Vistakon®		Control	
Other Serious or Significant Events (non-infiltrative)	**N**	**%**	**N**	**%**
Iritis	6*	0.6	0	0.0
Optic Neuritis	1	0.1	0	0.0
Keratitis	1	0.1	0	0.0
≥ Grade 3 Corneal Staining	4	0.4	0	0.0
Grade 3 Central Corneal Edema	1	0.1	1	0.1
Total	13	1.3%	1	0.1%

* 5/6 related to corneal events in Table 2, 1/6 thought to be not lens-related

Of the 1037 subjects dispensed, 743 completed the study, while 294 subjects were discontinued. Reasons for discontinuation included: ineligible dispensed, unsatisfactory visual response, unsatisfactory physical response, adverse event, unacceptable fit, discomfort, disinterest, loss to follow-up, non-compliance to protocol, relocation, and "other" reasons.

The observed numbers of corneal inflammatory endpoint events for the study were 60 in the VISTAKON® lens and 24 events in the control lens. After a multiple imputation analysis to account for subjects who did not complete the study, the imputed numbers of events in the two groups were computed to be 70 and 29, for VISTAKON® and control lens respectively.

A substantial number of subjects wore the VISTAKON® lens for 22-30 days. In order to analyze the data to support approval of the VISTAKON® lens for 7 day extended wear the findings from a meta-analysis presented by Loretta B. Szcotka-Flynn and Mireya Diaz-Insua (*Risk of Infiltrates and CLPC With Traditional Hydrogel and Silicone Hydrogel Extended Wear: A Meta Analysis*, ARVO, 2005) were used. The meta-analysis found that the odds ratio for the rate of infiltrates for 30 day extended wear compared to 7 day wear was 3.39 (95% confidence limits 1.97 and 5.80). Using the point estimate of 3.39 and the number of imputed endpoint events, the 7 day rate for the VISTAKON® lens was estimated. This was compared to the imputed rate for the control lens (Table 4). Statistical analyses were conducted as an unconditional test of non-inferiority, $p < 0.00001$.

Table 4
Estimated number of Adverse Events in 7-day Extended Wear*

Adverse Events	Control	Vistakon®
Event	29 (2.80%)	21 (2.03%)
No Event	1008 (97.20%)	1016 (97.97%
Total	1037	1047

***Vistakon 7-day extended wear rate estimated by adjusting for the difference in wearing time using odds ratio of 3.39.**

Data Analysis and Results—Symptoms, Problems and Complaints (SPC)

The differences in the proportion of eyes with a positive response to "Have you experienced any symptoms or problems since your last visit?" between VISTAKON® and control lenses were determined and 95% upper one-tailed confidence limits were calculated. Results are shown in Table 5.

Table 5
Symptoms, Problems and Complaints

	All available patients		Completed patients only	
	n/N	%	n/N	%
Vistakon lens rate	639/1037	61.6%	455/743	61.2%
Control lens rate	751/1037	72.4%	537/743	72.3%
Delta		-10.8%		-11.0%
95% Upper Bound		-8.2%		-8.0%

The most frequently reported SPC were dryness, irritation/discomfort and lens awareness for both the VISTAKON® and control lenses.

Data Analysis and Results—Visual Acuity

The differences in the proportion of eyes with contact lens acuity less than 20/40 between VISTAKON® and control lenses were determined and 95% upper one-tailed confidence limits were calculated. Results are shown in Table 6.

Table 6
Contact Lens Visual Acuity (worse than 20/40*)

	All available patients		Completed patients only	
	n/N	%	n/N	%
Vistakon lens rate	3/1028	0.3%	2/743	0.3%
Control lens rate	3/1028	0.3%	2/743	0.3%
Delta		0.0%		0.0%
95% Upper Bound		0.4%		0.4%

*eyes with acuity <20/40 reported at any study visit

Best corrected contact lens visual acuity was captured for all eyes at initial and final visits when wearing the study lens. A total of 2074 eyes had a visual acuity of 20/30 or better upon study entry. 1037 eyes were dispensed the control lens and 1037 eyes were dispensed the VISTAKON® (senofilcon A) Soft Contact Lens. The lenses were worn contralaterally (control lens in one eye, VISTAKON® (senofilcon A) Soft Contact Lens in the other eye).

Of the 1037 eyes dispensed the control lens, 97.2% reported visual acuity as 20/30 or better at the final visit while wearing the control lens. Of the 1037 eyes

dispensed the VISTAKON® (senofilcon A) Soft Contact Lens, 97.4% reported visual acuity as 20/30 or better at the final visit while wearing the VISTAKON® (senofilcon A) Contact Lens. Final visual acuity was not reported for 2.4% of the eyes wearing the control lens and 2.3% of the eyes wearing the VISTAKON® (senofilcon A) Soft Contact Lens.

Of the eyes dispensed the control lens, 0.4% reported acuity worse than 20/30 at the final visit while wearing the lens. Three eyes reported 20/40 and the investigator reported the following reasons: a change in Rx, the subject was wearing two lenses, and one reason was not recorded. One eye reported 20/50 and the investigator attributed the reason to a dirty lens and the eye was watering. The final visual acuity for this subject when wearing their own lenses was recorded as 20/20.

Of the eyes dispensed the VISTAKON® (senofilcon A) Soft Contact Lens, 0.3% reported acuity worse than 20/30 at the final visit while wearing the lens. One eye reported 20/40 and the investigator attributed the reason to SPK. The final visual acuity for this subject when wearing their own lenses was recorded as 20/20. One eye reported 20/50 and the investigator attributed the reason to severe deposits on the lens. One eye reported 20/70 and the investigator reported filmy deposits. Final visual acuity for both subjects was recorded as 20/20.

Data Analysis and Results—Slit Lamp Findings

For all visits and all eyes, 0.1% of the control eyes and 0.5% of the VISTAKON® eyes had slit lamp findings that were rated grade 3 or higher. Table 7 shows the percent of Grade 3 and 4 slit lamp findings by category throughout the trial.

Table 7
Grade 3 & 4 Slit Lamp Findings

	Vistakon®		Control	
	n/N	%	n/N	%
Injection	58/8133	0.7%	18/8128	0.2%
Tarsal Abnormality	57/8133	0.7%	8/8128	0.1%
Staining	43/8133	0.5%	7/8126	0.1%
Other	23/8132	0.3%	11/8127	0.1%
Edema	12/8132	0.1%	4/8128	0.0%

Data Analysis and Results—Wear Time

The majority (75.5%) of VISTAKON® wearers who completed the study reported wearing times between 22 and 30 days. The majority (96.0%) of control lens wearers who completed the study reported wearing times between 5 and 7 days.

XI. CONCLUSIONS DRAWN FROM THE STUDY

The results of the preclinical and clinical studies provide reasonable assurance of the safety and effectiveness of the VISTAKON® (senofilcon A) contact lenses for the subject population, refractive conditions, and specified duration of wear. Although the potential exists for minor differences in physiological response by gender for the target population, the minimal number of clinically significant findings does not indicate that gender differences are of clinical importance for this device.

XII. PANEL RECOMMENDATION

In accordance with the provisions of section 515 (c)(2) of the Act as amended by the Safe Medical Devices Act of 1990, this PMA was not referred to the Ophthalmic Devices Panel, an FDA advisiory committee, for review and recommendation because the information in the PMA substantially duplicates information previously reviewed by this Panel.

XIII. CDRH DECISION

FDA issued an approval order on December 20, 2005. The applicant's manufacturing facilities were inspected on January 28, 2005 and found to be in compliance with the device Good Manufacturing Practice regulations.

XIV. APPROVAL SPECIFICATIONS

Directions for use: See the labeling.

Hazards to Health from Use of the Device: See the Indications, Contraindications, Warnings, Precautions and Adverse Events in the labeling.

Postapproval Requirements and Restrictions: See approval order.